CLAIMS

1. A method for translating multidimensional digital frame structures, the method comprising:

receiving a frame with overhead bytes organized in a first system; and

translating the frame so that the overhead bytes are organized in a second system.

2. The method of claim 1 wherein receiving a frame with overhead bytes organized in a first system includes receiving an overhead byte in a first location; and

wherein translating the frame so that the overhead bytes are organized in a second system includes relocating the overhead byte to a second location.

3. The method of claim 1 wherein receiving a frame with overhead bytes organized in a first system includes receiving an overhead byte having a first value; and

wherein translating the frame so that the overhead bytes are organized in a second system includes replacing the overhead byte with a second value.

4. The method of claim 1 wherein receiving a frame with overhead bytes organized in a first system includes receiving a first overhead byte; and

wherein translating the frame so that the overhead bytes are organized in a second system includes adding a second overhead byte.

5. The method of claim 1 wherein receiving a frame with overhead bytes organized in a first system includes receiving a first overhead byte; and

wherein translating the frame so that the overhead bytes are organized in a second system includes removing the first overhead byte.

6. The method of claim 1 wherein receiving a frame with overhead bytes organized in a first system includes receiving a first byte in a first location; and

wherein translating the frame so that the overhead bytes are organized in a second system includes replacing the first byte with a second byte, and locating the second byte in a second location, different than the first location.

7. The method of claim 1 wherein the overhead bytes are selected from the group of overhead byte functions including frame synchronization bytes, data communication channel (DCC) bytes, bit interleaved parity (BIP) bytes, Trace bytes, and multiframe alignment signal bytes.

8. The method of claim 1 further comprising:

preceding the translating of the frame, accessing translation parameters; and

wherein translating the frame so that the overhead bytes are organized in a second system includes translating in response to the accessed translation parameters.

9. The method of claim 8 further comprising:

preceding the accessing of translation parameters, determining a destination node;

determining the source node from which the frame is received;

comparing the first overhead byte organization associated with the source node to the second overhead byte organization associated with the destination node; and

wherein accessing translation parameters includes creating translation parameters in response to comparing the first and second overhead byte organizations.

10. The method of claim 9 further comprising:

transmitting the frame with overhead bytes organized in the second system to the destination node.

11. The method of claim 10 wherein receiving a frame with overhead bytes organized in a first system includes receiving a first frame synchronization byte in a first location, and a second frame synchronization byte in a second location; and

wherein translating the frame so that the overhead bytes are organized in a second system includes locating the first byte in a third location, and the second byte in a fourth location in the frame.

12. The method of claim 11 wherein translating the frame so that the overhead bytes are organized in a second system includes the first and third locations being different.

13. The method of claim 12 wherein translating the frame so that the overhead bytes are organized in a second system includes the second and fourth locations being different.

14. The method of claim 10 wherein receiving a frame with overhead bytes organized in a first system includes receiving a first frame synchronization byte value; and

wherein translating the frame so that the overhead bytes are organized in a second system includes replacing the first frame synchronization byte value with a second frame synchronization byte value.

15. The method of claim 10 wherein receiving a frame with overhead bytes organized in a first system includes receiving a first frame synchronization byte; and

wherein translating the frame so that the overhead bytes are organized in a second system includes dropping the first frame synchronization byte.

16. The method of claim 10 wherein receiving a frame with overhead bytes organized in a first system includes receiving a first frame synchronization byte; and

wherein translating the frame so that the overhead bytes are organized in a second system includes adding a second frame synchronization byte.

17. The method of claim 1 wherein receiving a frame with overhead bytes organized in a first system includes receiving a frame with a forward error correction bytes in an active parity section; and

wherein translating the frame so that the overhead bytes are organized in a second system includes ignoring the forward error correction bytes so that parity section is not active.

18. The method of claim 1 wherein receiving a frame with overhead bytes organized in a first system includes receiving a frame with bytes in a non-active parity section; and

wherein translating the frame so that the overhead bytes are organized in a second system includes calculating the forward error correction bytes for the frame and making the parity section active.

19. An integrated circuit (IC) relay device for translating a multidimensional digital frame structure, the device comprising:

a frame transmitter including an overhead generator to generate the overhead section of a frame, a payload generator to generate

the payload section of the frame, and an encoder to provide forward error corrected (FEC) for the frame; and

wherein the overhead generator includes an input to receive overhead bytes that have been translated from a first system to a second system.

20. The device of claim 19 further comprising:

a frame receiver including an overhead receiver to receive the overhead section of the frame, a payload receiver to receive the payload section of the frame, and a decoder to provide a forward error corrected (FEC) frame; and

wherein the overhead receiver includes an output to provide the overhead bytes organized in the first system.

21. The device of claim 20 wherein the overhead receiver receives an overhead byte in a first location; and

wherein the overhead generator supplies the overhead bytes relocated to a second location.

22. The device of claim 20 wherein overhead receiver receives an overhead byte having a first value; and

wherein the overhead generator replaces the overhead byte first value with a second value.

23. The device of claim 20 wherein overhead receiver receives a first overhead byte; and

wherein the overhead generator adds a second overhead byte to the frame overhead section.

24. The device of claim 20 wherein the overhead receiver receives a first overhead byte; and

wherein the overhead generator removes the first overhead byte from the frame overhead section.

25. The device of claim 20 wherein the overhead receiver receives a first byte in a first location; and

wherein the overhead generator replaces the first byte with a second byte, and locates the second byte in a second location, different than the first location.

26. The device of claim 20 in which the overhead bytes are selected from the group including frame synchronization bytes, data communication channel (DCC) bytes, bit interleaved parity (BIP) bytes, Trace bytes, and multiframe alignment signal bytes.

27. The device of claim 20 further comprising:

a translator having an input to accept the overhead bytes from the overhead receiver, and an input to accept translation information, and an output connected to the overhead generator to supply overhead bytes translated from a first system to a second system.

28. The device of claim 27 wherein the translator accepts translation information including the source node of the received frame and the destination node of the transmitted frame, wherein the translator compares the first overhead byte organization associated with the source node to the second overhead byte organization associated with the destination node, and wherein the translator translates overhead bytes in response to comparing the first and second overhead byte organizations.

29. The device of claim 20 wherein the decoder has an input to accept commands to selectively correct a frame, and wherein the decoder receives forward error correction bytes in an active parity section of a frame and does not correct the frame in response to selective correction commands.

30. The device of claim 29 wherein the decoder receives in a non-active parity section of a frame; and

wherein the encoder has an input to accept commands for selectively encoding a frame with forward error correction, and wherein the encoder encodes the frame and supplies the forward error correction bytes in an active parity section of a frame.

31. An integrated circuit (IC) relay system for translating a multidimensional digital frame structure, the system comprising:

a source node having an output to send a frame;

a frame receiver including an overhead receiver to receive the overhead section of the frame and an output to supply the overhead bytes, a payload receiver to receive the payload section of the frame, and a decoder to provide a forward error corrected (FEC) frame;

a translator having an input to accept the overhead bytes from the overhead receiver, and input to accept translation information, and an output to supply overhead bytes translated from a first system to a second system;

a frame transmitter including an overhead generator having an input connected to the output of the translator to generate the overhead section of a frame, a payload generator to generate the payload section of the frame, and an encoder to provide forward error corrected (FEC) for the frame; and

a destination node having an input to accept the transmitted frame.